

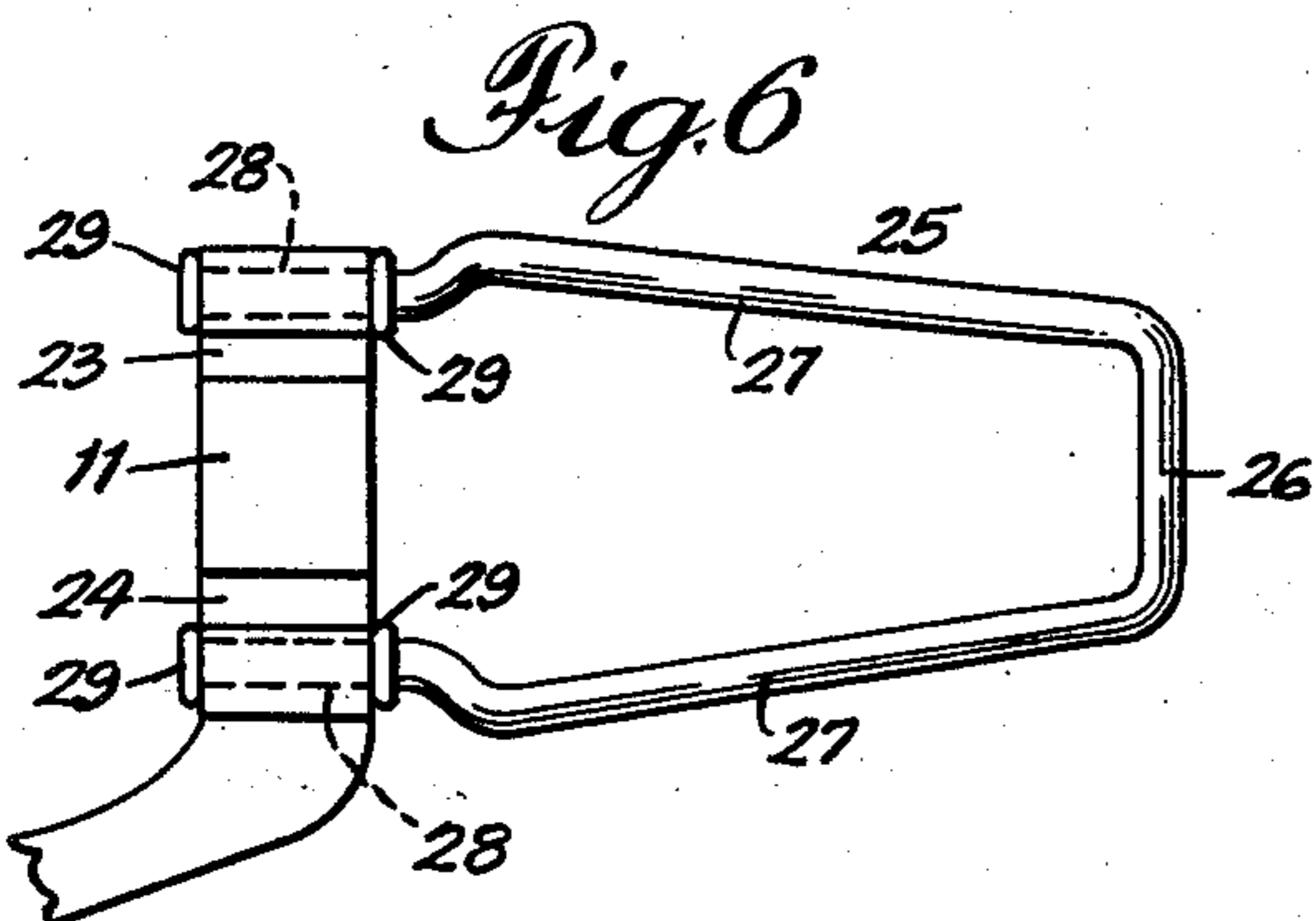
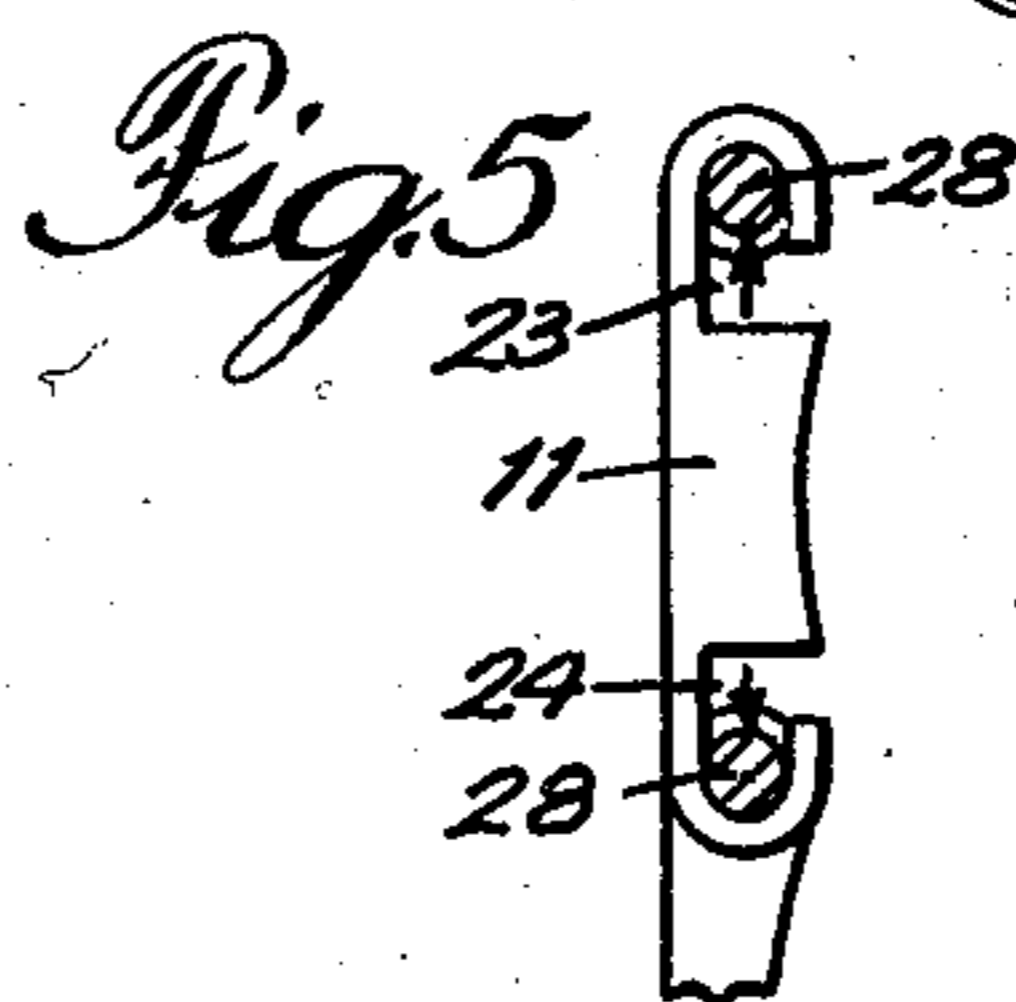
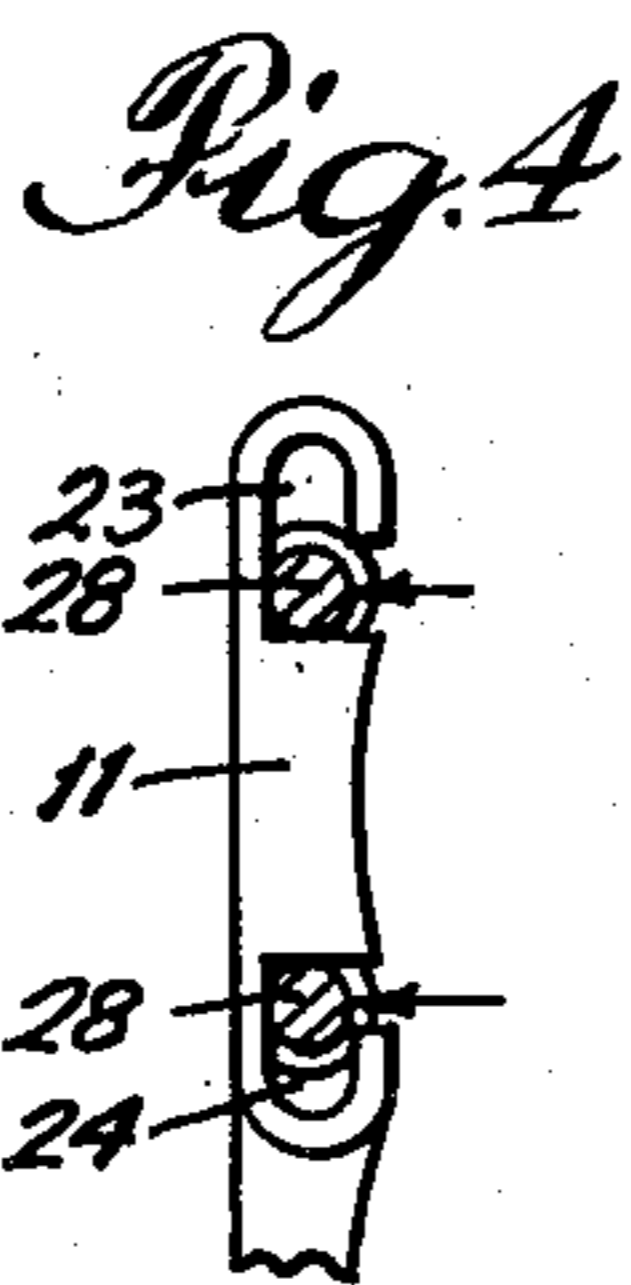
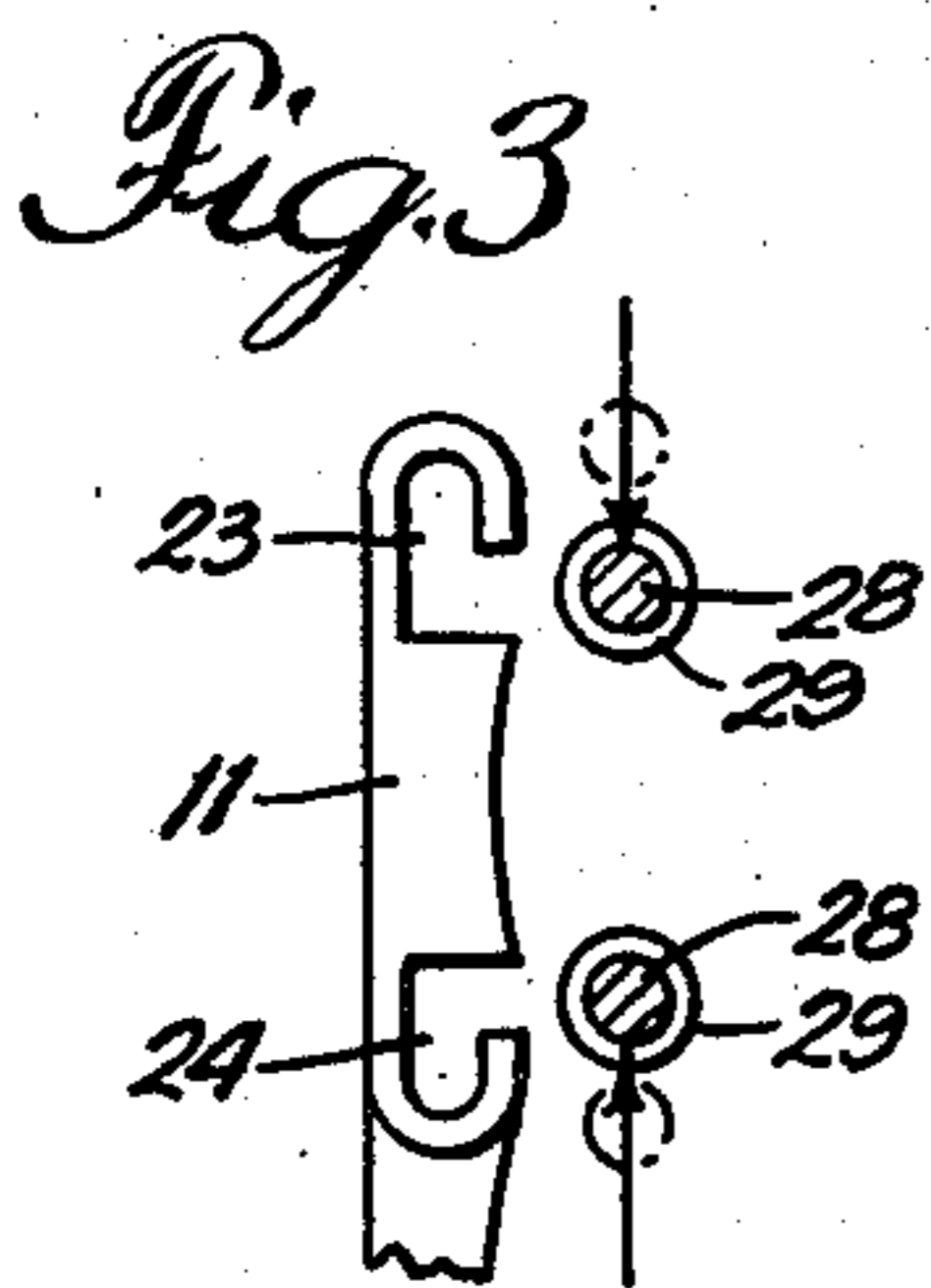
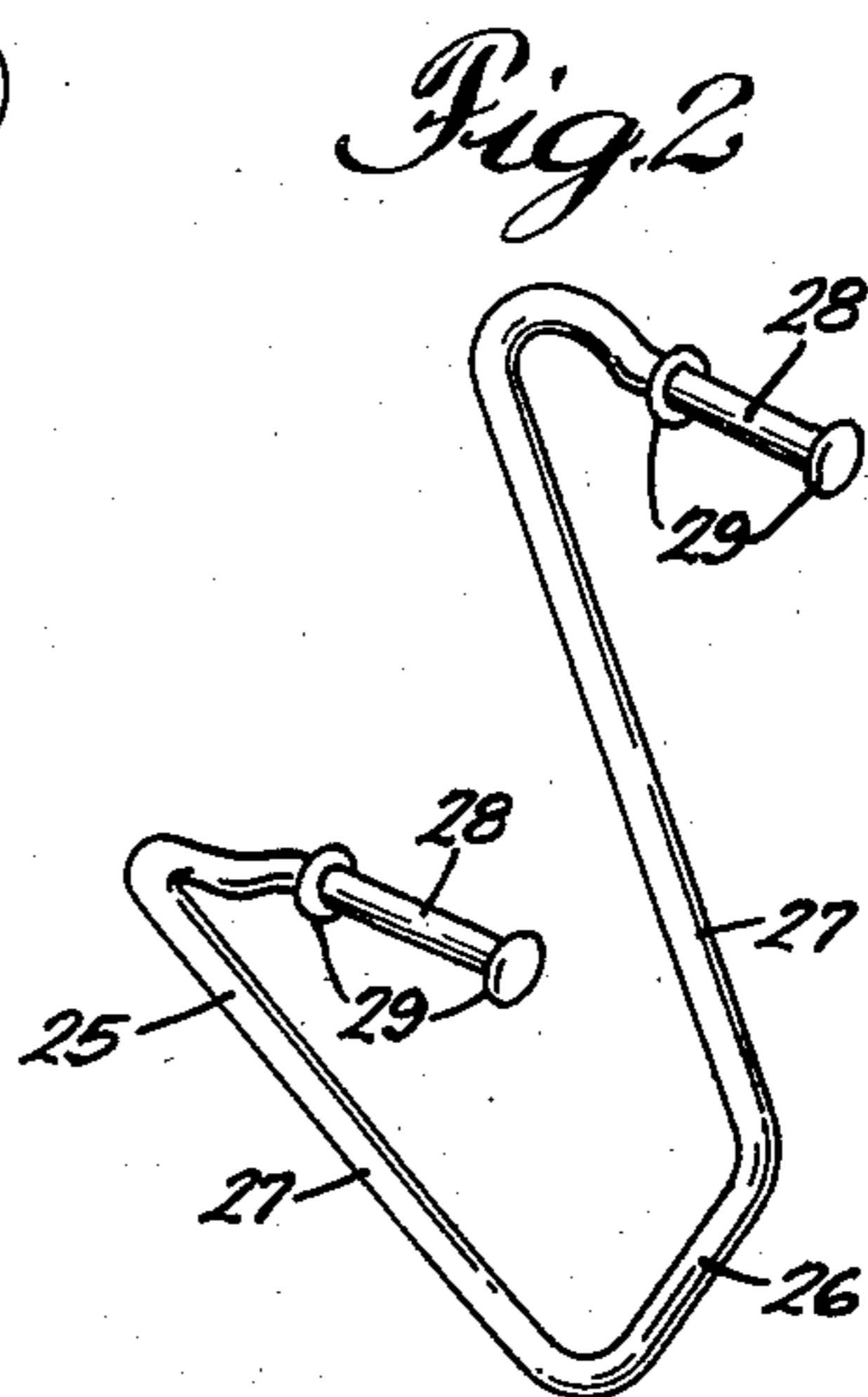
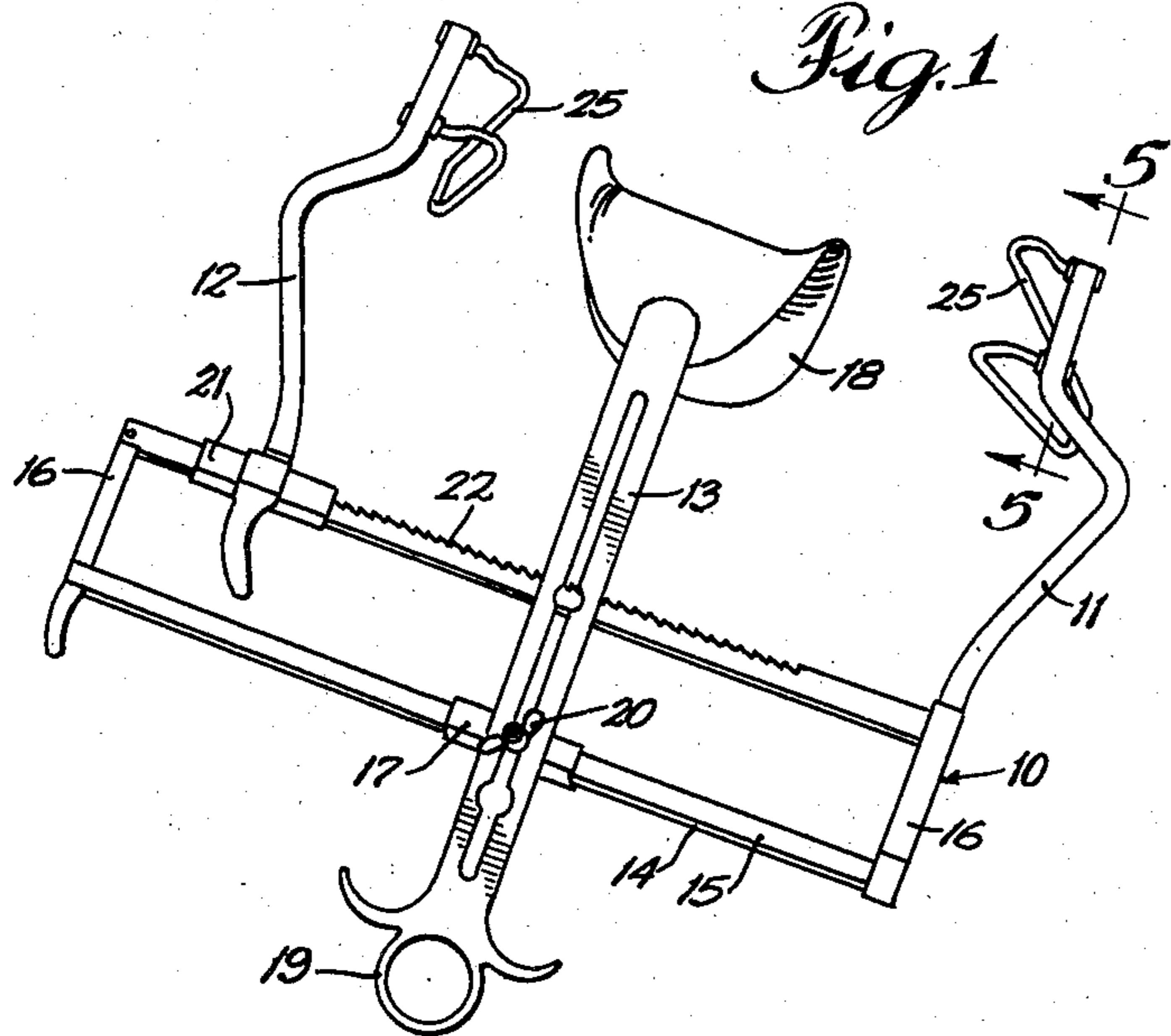
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RETRACTOR

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2,850,008

## RETRACTOR

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5 Claims. (Cl. 128—20)

This invention relates to an improvement in retractors for holding apart the edges of wounds during surgical operations, and more specifically, to self-retaining retractors having interchangeable blades or hooks.

Interchangeable-blade retractors are frequently used in those surgical operations, such as abdominal operations, where blades or hooks of various lengths may be required, depending upon the thickness of the body wall. Where the body wall is thick because of a heavy layer of fat, relatively long hooks are mounted upon the retractor arms to spread and hold apart the edges of the body wall about the incision. On the other hand, hooks of shorter length are used where the patient is slender and the body wall is relatively thin.

One of the difficulties associated with present retractors lies in the fact that the blades are generally secured to the retractor arms by thumb nuts. If, at the commencement of an operation, the surgeon finds that hooks or blades of different lengths are required, the thumb nuts must be unthreaded and another set of arms secured in place. The resultant delay in the operation while the blades are being interchanged is obviously undesirable, especially where the interchange is required after the incision has been made. Furthermore, the small thumb nuts may tend to loosen during the manipulation of the device, thereby creating the possibility of further delays and difficulties should the parts become detached and fall into the wound.

Therefore, one of the main objects of the present invention is to provide a retractor with interchangeable hooks or blades which overcomes the aforementioned defects and disadvantages of present structures. Another object is to provide a retractor having interchangeable or detachable hooks which may be easily and quickly mounted upon the retractor arms without necessitating the use of additional connecting parts. A still further object is to provide a self-retaining retractor having arms equipped with removable hooks, the hooks cooperating with the arms to provide increased resistance to detachment in response to the forces exerted by the separated edges of the body wall.

Other objects will appear from the specification and drawings. Figure 1 is a perspective view of a retractor embodying the present invention; Figure 2 is an enlarged perspective view of one of the detachable retractor hooks; Figure 3 is an enlarged broken side view of a retractor arm with a hook, shown in section, as it is disposed for mounting upon the arm; Figure 4 is a view similar to Figure 3 but showing a subsequent step in the mounting of the arm; Figure 5 is similar to Figures 3 and 4 but showing the arm in fully mounted position, the view being taken along line 5—5 of Figure 1; and Figure 6 is a broken enlarged view of an arm and hook showing structural details thereof.

In the embodiment shown in the drawings, the numeral 10 generally designates a self-retaining retractor having a pair of arms 11 and 12 and a central member 13 mounted

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upon a frame 14. The frame consists of a pair of parallel elongated bars or members 15 and a pair of end members 16. A sleeve 17 is slidably carried by one of the longitudinally extending bars 15 of the rectangular frame and is equipped with a screw which projects through the longitudinal slot of the central retracting member 13. One end of member 13 is equipped with a curved blade or hook 18 for grasping the body wall and is provided at its opposite end with a suitable handle 19 for retracting or extending that member. A wing nut 20 is threaded onto the screw of sleeve 17 and may be tightened for locking retractor member 13 in place.

As shown in Figure 1, arm 11 is rigidly secured to an end piece 16 of the frame while arm 12 is secured to a sleeve 21 which is carried by the other longitudinal member 15 of that frame. Preferably the longitudinal member supporting arm 12 is provided with teeth 22 which are engaged by a ratchet within sleeve 21 (not shown) for holding arm 12 in a selected position. Since the above-described structure is entirely conventional, a more detailed description of this structure is believed unnecessary for the purpose of the disclosing the present invention.

Near the free end of each of the arms 11 and 12 are a pair of horizontally, elongated slots or openings 23 and 24 (Figure 3) which extend in the general direction of relative arm movement. As illustrated most clearly in Figure 3, the openings of each arm are spaced apart and are generally L-shaped; two corresponding portions or legs of the L-shaped openings being parallel and extending in the same direction, while the other two corresponding legs extend away from each other in opposite directions. The inner portions of the paired slots or openings extend through the under surface of each arm for receiving the end portions of a spring hook 25.

In Figure 2 it will be seen that each of the spring hooks 25 has a generally U-shaped configuration, being equipped with a base portion 26 and legs 27 which extend along the same general plane. The free end portions 28 of the spring legs are substantially parallel and extend outwardly away from the plane of legs 27. Each of the end portions 28 is provided with a pair of spaced enlargements or flanges 29 which snugly engage opposite sides of the retractor arms 11 and 12 upon which the spring hooks are mounted.

Hooks 25 are formed of wire composed of a strong, flexible material such as stainless steel. Similarly, the entire retractor structure may be formed of stainless steel or other suitable material. It is to be understood that the spring arms are provided in pairs of corresponding size and shape and that a number of pairs of different sizes (i. e. different leg lengths) are contemplated. Thus, the pairs of hooks may be interchanged to meet the requirements of a particular surgical operation.

As shown in the drawings, the spring hooks are attached to the arms by simply urging the end portions 28 towards each other until they are aligned with the inner portions of slots 23 and 24 along the bottom of each retractor arm (Figure 3). The end portions are then thrust into the slots (Figure 4) and released so that the legs of the U-shaped hooks may expand outwardly in opposite directions and lock the end portions within the slots. Similarly, the spring hooks may be detached from the respective retractor arms by simply urging the end portions together and then withdrawing them from the slots.

Since the end portions of each spring hook are normally spaced farther than the distance between the slots of each retractor arm, the hooks remain under tension as long as they are mounted upon the arms, thereby holding the end portions snugly within the slots. Further, it should be noted that when the spring hooks are attached the end portions 28 extend through the slots in the direc-

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tion of relative arm movement and the flanges 29 snugly engage opposite sides of the arms. Thus, when the retractor arms 11 and 12 are separated to spread the edges of the body wall bordering the incision the opposing forces imposed upon the paired hooks by the wall will tend to twist end portions 28 out of horizontal alignment with the outer portions of horizontally elongated slots 23 and 24 and will thereby increase the frictional contact between flanges 29 and the opposite sides of the arms, and between end portions 28 and the surfaces defining the outer portions of the slots.

While in the foregoing I have disclosed my invention in considerable detail for purposes of illustration, it will be understood by those skilled in the art that many of these details may be varied considerably without departing from the spirit and scope of the invention.

I claim:

1. In a surgical retractor having a pair of arms movable towards and away from each other, said arms each having adjacent their free ends a pair of parallel slots extending therethrough in the direction of arm movement, said pairs of slot having inner portions opening through the underside of each of said arms and having outer portions spaced farther apart than said inner portions, a pair of spring hooks detachably carried by said arms for engaging and holding apart the edges of a surgical wound, said spring hooks each having a pair of end portions normally spaced farther apart than the distance between the slots of each pair and being disposed within the outer portions of said slots under tension, said end portions being provided with spaced flanges for engaging opposite sides of said arms and being insertable and removable for said slots through the inner portions thereof upon compression of the spring hooks.

2. The structure of claim 1 in which said spring hooks are generally U-shaped and are equipped with a pair of spring legs lying along substantially the same plane, said end portions of each of said hooks extending in the same direction away from the plane of said legs.

3. In a surgical retractor having a pair of retractor arms extending in substantially the same direction and being movable towards and away from each other, said

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arms each having adjacent their free ends a pair of L-shaped slots having inner portions opening through one side of said arms and outer portions extending outwardly in opposite directions, a pair of spring hooks detachably carried by said arms for engaging and holding apart the edges of a surgical wound, said spring hooks each being formed of spring wire and having a pair of end portions normally spaced farther apart than the distance between the slots of each pair and being disposed within the outer portions of the slots under tension, said end portions being provided with spaced flanges frictionally engaging opposite sides of said arms and being insertable and removable from said slots through the inner portions thereof upon compression of said spring wire hooks.

4. The structure of claim 3 in which said spring wire hooks are generally U-shaped and are equipped with a pair of string legs lying along substantially the same plane, said end portions of each of said hooks being formed integrally with said legs and extending in the same direction away from the plane of said legs.

5. In a surgical retractor having at least one retractor arm, said arm having a pair of elongated parallel slots extending therethrough, said slots having L-shaped cross sections providing inner portions opening through the underside of said arm and outer portions extending outwardly in opposite directions at substantially right angles to the direction of arm movement, and a spring wire hook detachably carried by said arm for engaging and holding the edge of a surgical wound, said spring wire hook having a pair of terminal portions normally spaced farther apart than the distance between said pair of slots and being disposed within the outer portions of said slots under tension, said terminal portions being provided with spaced flanges frictionally engaging opposite sides of said arm and being freely insertable and removable from said slots through the inner portions thereof upon compression of said spring wire hook.

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